Chapter 10 OXYGEN SYSTEM

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DESCRIPTION

1. The oxygen system is supplied from 2,250 litre storage cylinders installed outside the pressure cabin. For the location of the cylinders see Table 1. All the cylinders are charged from one external charging point in the port servicing bay, a high pressure filter being fitted in the line between the charging point and the cylinders.

2. The cylinders supply oxygen through a fixed piping system to the following crew stations:—

First pilot
Second pilot
Bomb aimer's prone position
Air electronics officer
Navigator
Radar operator/bomb aimer
An additional crew member (post-Mod. 2805)

At each of these positions is fitted a demand type regulator and low pressure hose fitted with ratchet type clip to engage with the special face masks.

Emergency oxygen sets

3. Both pilots are accommodated in ejection seats specially designed to enable them to wear parachutes which contain an emergency oxygen cylinder in the pack. The remainder of the crew are equipped with seats designed for them to wear back type parachutes which also contain an emergency oxygen supply. Before an emergency exit is made the main supply must be disconnected and the emergency supply connected. The pilots can use the emergency supply by pulling the yellow painted knob at the outboard side of their seats. In aircraft post-Mod. 1306 the pilots' emergency oxygen supply is positioned on the inboard side of the ejection seat rails and a release lever is provided on the inboard side of the seat pan.

Portable oxygen equipment

4. Aircraft post-Mod. 848 carry a Mk. 4 portable oxygen set which is stowed at the rear of the navigator's seat. In aircraft post-Mod. 2735 the portable set is replaced by a dual-feed extension lead, stowage for the lead being provided at the starboard side of the cabin.

SERVICING

Pipe coding and equipment location

5. The Tables 1 and 2 will be found useful when tracing the oxygen system piping and locating the equipment in the aircraft. Where piping passes through a bulkhead, the code denoting its service is painted adjacent to the pipe. For example G.1 indicates that the pipe is in the line from the external charging connection to the cylinders.

Testing for leaks

6. If leaks are suspected in the system, it may be tested under pressure as described in Table 3.

Portable oxygen set (pre-Mod. 2735)

7. The portable oxygen cylinder can be recharged from a connection in the aircraft system at the rear edge of the pilots' floor. Reference should be made to A.P.1275G, Vol. 1 for additional information on oxygen systems and instruments.

Oxygen cylinder removal

8. To remove a cylinder, disconnect the supply pipes and fit blanking caps, then release the securing straps and remove the cylinder. When refitting a cylinder it should be so positioned before tightening the strap that no undue strain is put on the supply pipe.

Miscellaneous

9. Components in the medium and low pressure systems may be removed when the high pressure valves are closed. It is essential to fit blanking caps to all pipes disconnected. When refitting a component, ensure that the joints are clean and dry and free from all traces of oil or grease.

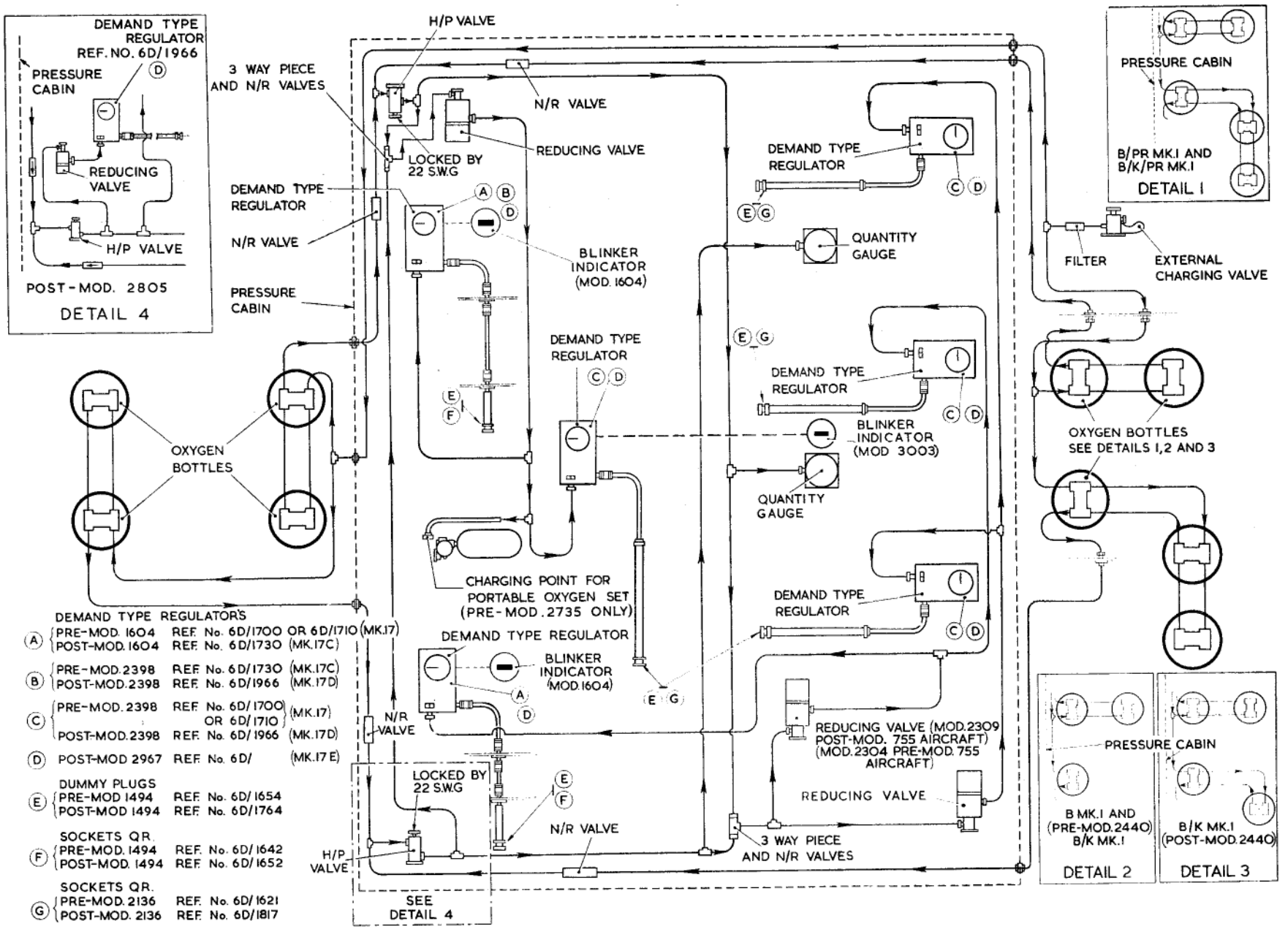

Fig. 1. Oxygen system diagram

(Mod. 3003 introduces an additional blinker indicator)

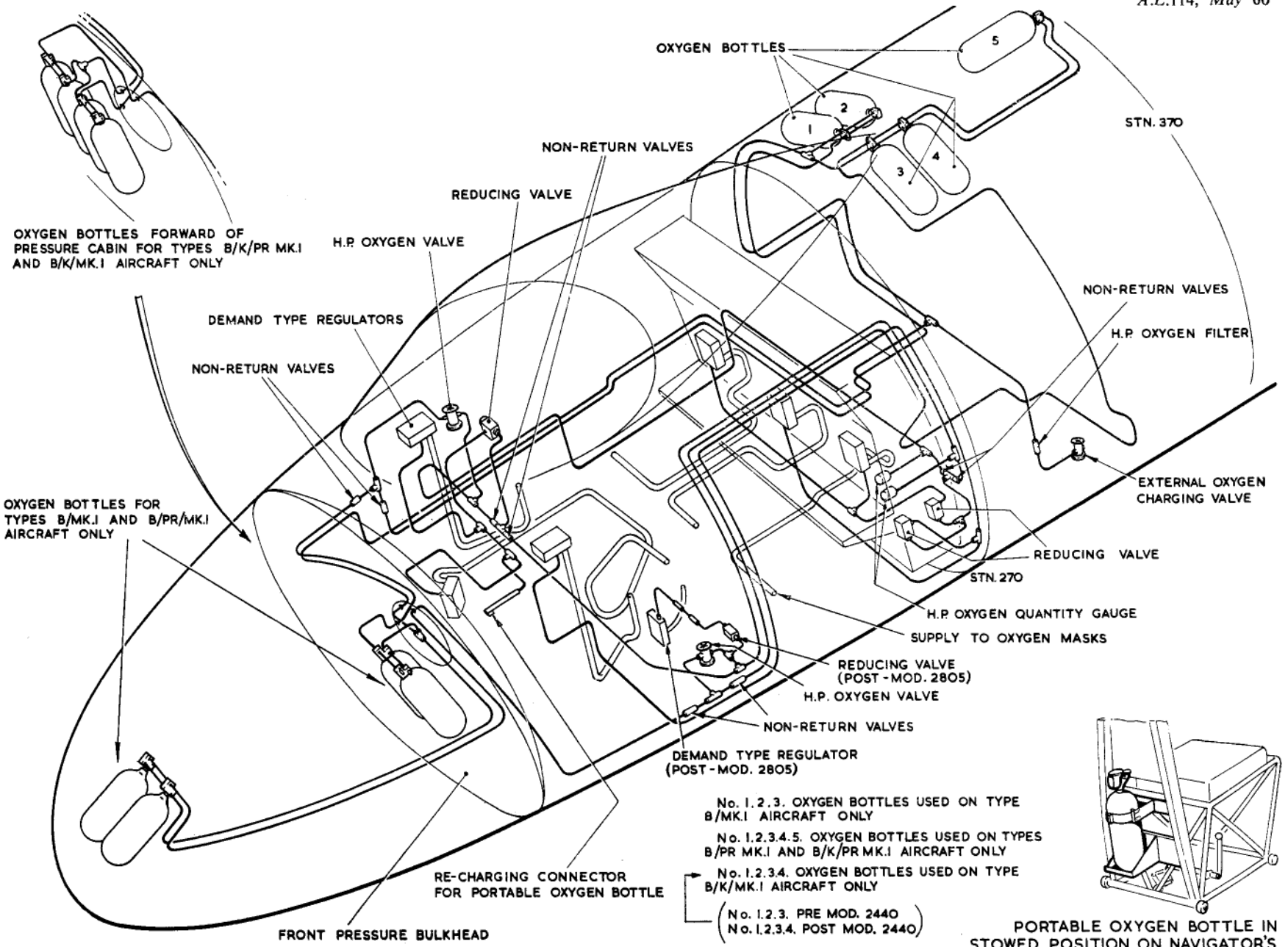

Fig. 2. Oxygen system location diagram (*Additional demand type regulator on port side*)

TABLE 1

Location of components

Component	*Part No. or Ref. No.*		*Location*
			Nose section : —
Oxygen cylinder c/w five-way piece	6D/1398 6D/756		B Mk. 1 and B/PR Mk. 1, two pairs in nose section. B/K/PR Mk. 1 and B/K Mk. 1, four cylinders on forward face of front pressure bulkhead.
			Servicing bay above nose wheel : —
Oxygen cylinder c/w five-way piece	6D/1398 6D/756		B Mk. 1, three cylinders. B/PR Mk. 1 and B/K/PR Mk. 1, five cylinders. B/K Mk. 1 (pre-Mod. 2440), three cylinders. B/K Mk. 1 (post-Mod. 2440), four cylinders.
Demand type regulator (6) ◀or (7) post-Mod. 2805▶	6D/1966 6D/1700 6D/1710 6D/1730 6D/1647	according to Mod. state	One at each crew member's position, wire locked ON.
High pressure oxygen valve Mk. B (2)	6D/223		At the pilots' positions, wire locked in the open position, with 22 s.w.g. non-corrodible wire which will break when the valve is manually operated.
Reducing valve (3) ◀or (4) post-Mod. 2805▶	6D/1616		One on the starboard side of the cabin wall adjacent to the regulator and two behind the navigator's crate adjacent to the ◀rear pressure bulkhead, port side of cabin. One at control rod guard, Stn. 168·4 (post-Mod. 2805).▶
External charging valve Mk. 8	6D/223		In port servicing bay.
H.P. Quantity gauge (2)	◀6D/1615 or 2237▶		On port side of navigator's crate.
H.P. filter Mk. 1 (4)	6D/574		◀Nose wheel bay (in external supply line).▶
Non-return valve Mk. 1 (8)	6D1427		
Aerolex clip—Type D (2) ◀or (3) post-Mod. 2805▶	6D/1698		◀Pilots' low pressure hose and additional crew member's low pressure hose (post-Mod. 2805).▶
Dummy plug (4)	6D/1764	pre-Mod. Inst. G216-6D/1654	On crew members' flexible hose.
Portable oxygen set Mk. 4 (1)	6D/1608	Mod. 848, pre-Mod. 2735	Fitted on rear of navigator's seat.
Socket Q.R., Mk. 8 (locking type) (4)	6D/1621	pre-Mod. 2136	At each hose position except both pilots (pre-Mod. 2136).
Socket Q.R., Mk. 10A (4) ◀or (5) post-Mod. 2805▶	6D/1817	post-Mod. 2136	At each hose position except both pilots (post-Mod. 2136).
Recharging connector (for portable set)	6D/1611	pre-Mod. 2735	On rear edge of pilots' floor, starboard side.
Socket Q.R., L.P., Mk. 9 (2)	6D/1652	post-Mod. 1494	Pilots' positions only.
Socket Q.R., L.P., Mk. 7 (2)	6D/1642	pre-Mod. 1494	
Blinker indicator (2)	C5165/Y - Mk. 7		Pilots' positions only.

TABLE 2

Pipe coding

Code	Pipeline		
G1	Charging valve to cylinders		
G2	Front cylinders to H.P. valve	—	port
G3	Front cylinders to H.P. valve	—	starboard
G4	H.P. valve to H.P. tee-piece	—	port
G5	H.P. valve to H.P. tee-piece	—	starboard
G6	Reducing valve to regulators	—	port
G7	Contents gauge	—	starboard
G8	Contents gauge	—	port
G9	Reducing valve to regulators	—	starboard
G10	H.P. tee-piece to reducing valve	—	port
G11	H.P. tee-piece to reducing valve	—	starboard
G15	Rear cylinders to H.P. valve	—	starboard
G16	Rear cylinders to H.P. valve	—	port

TABLE 3

Test procedure

Component and Test	Requirement
High pressure system Pressure test to 1,800 lb. per sq. in. (charging valve Mk. 8 to reducing valve). *Medium pressure system* Pressure test to 450 lb. per sq. in. (approx.) (reducing valve to Demand type regulators). *Low pressure system* Pressure test to 10 lb. per sq. in. (Demand type regulators to Q.R. sockets).	No observable leakage when tested with soap solution. For tests in aircraft, use oxygen only. For H.P., medium or low pressure testing of pipes, sub-assemblies, etc., before installation in aircraft, certified pure dry air may be used.
N.R.V. leak test	Maximum permissible leakage at individual valves 5 litres per min. at 1,800 lb. per sq. in. Maximum permissible leakage of all N.R.V.s combined in the high pressure system not to exceed 5 litres per min. at 1,800 lb. per sq. in.
H.P. valve leak test	Nil at 1,800 lb. per sq. in., OPEN or CLOSED.
Demand type regulator	Bench test before installation in aircraft.
Note . . . *Couple type A.13A/1 mask or special test suction tube to Q.R. socket with line valve* ON.	

TABLE 3. Test procedure—*continued.*

Component and Test	Requirement
Regulator ON-OFF *valve leak test* (Regulator valve OFF)	Blank off end of low pressure flex. Depress and release the switch; there should be no pressure build up in 30 seconds.
Line reducing valve test (Regulator valve ON)	Bench test prior to assembly in aircraft.
Emergency toggle switch test (Regulator valve ON)	Depress switch to R., L., and centre ; flow to be distinct from mask or test tube in each case. Fit plug to test tube (or nip mask tube). Flow to cease. Blinker to return to normal.
Supply hose and regulator up to Demand valve. Leak test. (Regulator valve ON, air inlet switch NORMAL ; plug in free end of test tube).	Set emergency toggle switch to R. or L. Turn regulator valve OFF. Time for regulator pressure to fall to zero not less than 1 min.
Oxygen supply test (Regulator valve ON. Air inlet switch NORMAL)	Visual blinker indicator to indicate while suction is applied at mask or test tube.
Pipes Pre-installation pressure test:— High and medium pressure system—2,700 lb. per sq. in. Low pressure system—10 lb. per sq. in.	No leaks.
Charging valve (*at completion of all tests*) With system pressurized and rubber hose connected to valve with other end in water.	No bubbles.

Note . . .

(1) *All pipes to be electrically bonded.*

(2) *Where the use of air is permitted for high, medium or low pressure testing it shall be* (a) *H.P. dry air at* 4,000 *lb. per sq. in. in transport cylinders Mk.* 7, *Mk.* 7*A or Mk.* 12, *Stores Ref.* 71*A*/28, 71*A*/29 *or* 71*A*/199, *provided a felt pad filter* (*Ref.* 6*D*/630) *is fitted in the line.* (b) *H.P. air supplied at* 1,800 *lb. per sq. in. in special cylinders certified clean and dry provided a felt pad filter* (*Ref.* 6*D*/630) *is fitted in the line.* (c) *Commercial H.P. air in cylinders, or a compressed air supply, provided that the usual oil separators, filters of silica gel and activited charcoal are fitted in the line with felt pad filters* (*Ref.* 6*D*/630) *fitted at the outlet of each supply.*

(3) *Felt pad filters must frequently be inspected and when the first upstream pad shows signs of discolouration all pads must be removed and those free from discolouration replaced in the same order in which they were removed, after new pads* (*Ref.* 6*D*/631) *have been inserted in the downstream end of the filter.*

WARNING

Traces of oil, grease or organic matter in contact with H.P. oxygen introduces a grave risk of explosion.